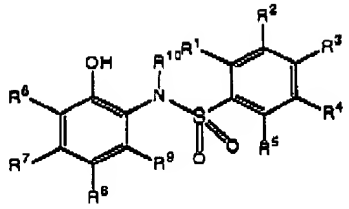
at least one member selected from the electron-accepting compound of the general formula (I),



(I)

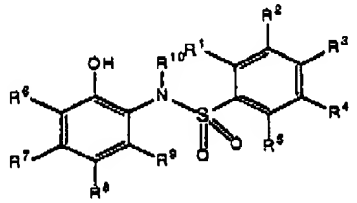
in which each of R^1 to R^9 respectively represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, arbitrary two groups selected from R^1 to R^5 may bond to each other to form a ring, arbitrary two groups selected from R^6 to R^9 may bond to each other to form a ring, and R^{10} represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, and N,N'-bis(2-hydroxyphenyl)-4,4'-biphenyldisulfonamide; and

at least one electron-accepting compound selected from a diphenylmethane derivative, a benzoic acid derivative, a salicylic acid derivative and a urea derivative.

50. (New) The heat-sensitive recording material of claim 49, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

51. (New) A heat-sensitive recording material having an undercoat layer containing a pigment and an adhesive as main components and a heat-sensitive recording layer on a substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound

which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, or the heat-sensitive recording material optionally further having at least one protective layer on the heat-sensitive recording layer, wherein said heat-sensitive recording layer contains a benzenesulfonamide derivative of the general formula (I),



(I)

in which each of R^1 to R^9 respectively represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, arbitrary two groups selected from R^1 to R^5 may bond to each other to form a ring, arbitrary two groups selected from R^6 to R^9 may bond to each other to form a ring, and R^{10} represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms; and

at least one electron-accepting compound selected from a diphenylmethane derivative, a benzonic acid derivative, a salicylic acid derivative, a diphenylsulfone derivative and a urea derivative.

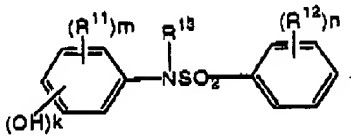
52. (New) The heat-sensitive recording material of claim 51, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

53. (New) The heat-sensitive recording material of claim 51, wherein the pigment contained in the undercoat layer is an oil-absorbing pigment which shows an oil absorption of 70 to 800 ml/100 g when measured according to JIS-K-5101 or organic hollow particles.

54. (New) The heat-sensitive recording material of claim 51, wherein the protective layer contains at least one selected from an acetoacetyl-modified polyvinyl alcohol, a carboxy-modified polyvinyl alcohol, a diacetone-modified polyvinyl alcohol or a silicon-modified polyvinyl alcohol, and a pigment, as main components.

55. (New) The heat-sensitive recording material of claim 51, wherein the heat-sensitive recording layer, the protective layer or both contain a benzotriazole-containing ultraviolet absorbent.

56. (New) A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said heat-sensitive recording layer contains two members selected from benzenesulfonamide derivatives of the general formula (II),



(II)

wherein each of R^{11}, R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2, and mixing weight ratio of two members of the benzenesulfonamide derivatives is from 1:9 to 9:1.

57. (New) The heat-sensitive recording material of claim 56, wherein the heat-sensitive recording layer contains a mixture prepared by mixing two members selected from benzenesulfonamide derivatives of the general formula (II) on a molecular level.

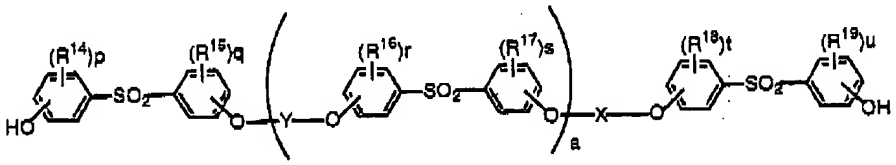
58. (New) The heat-sensitive recording material of claim 56, wherein the benzenesulfonamide derivatives are a combination of N-(4-hydroxyphenyl)-p-toluenesulfonamide and N-(2-hydroxyphenyl)-p-toluenesulfonamide.

59. (New) The heat-sensitive recording material of claim 56, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

60. (New) A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said

heat-sensitive recording layer contains a benzenesulfonamide derivative and a diphenylsulfonamide derivative,

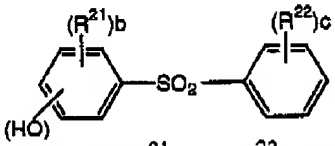
said diphenylsulfone derivative is a compound of the general formula (III),



(III)

wherein X and Y may be the same or different, each represents a linear or branched divalent hydrocarbon group which has 1 to 12 carbon atoms and may have a saturated or unsaturated ether bond, or a group represented by

in which R^{20} is a methylene group or an ethylene group and T is a hydrogen or an alkyl group having 1 to 4 carbon atoms, each of R^{14} to R^{19} independently represents a halogen atom, an alkyl group or an alkenyl group, each of p, q, r, s, t and u is an integer of 0 to 4, respectively, provided that when they are 2 or more, those represented by any one of R^{14} to R^{19} may be the same or different, respectively, and a represents an integer of 1 to 10, or a compound of the general formula (IV),

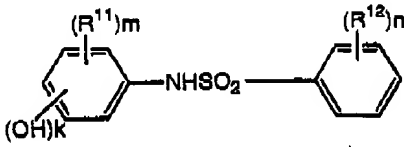


(IV)

wherein each of R^{21} and R^{22} independently represents a halogen atom, a hydroxyl group, an alkyl group,

an alkenyl group, an aralkyl group, an aryl group, an alkoxyl group or a phenylsulfonyl group, b represents an integer of 0 to 4 and c represents an integer of 0 to 5,

said the benzenesulfonamide derivative is a compound of the general formula (II-a),

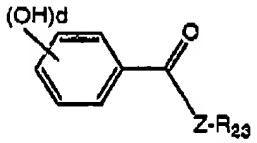


(II-a)

wherein each of R^{11} and R^{12} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2.

61. (New) The heat-sensitive recording material of claim 60, wherein the benzenesulfonamide derivative and the diphenylsulfone derivative are contained in a weight ratio of from 9:1 to 3:7.

62. (New) The heat-sensitive recording material of claim 60, wherein the heat-sensitive recording layer contains, as an additive, a hydroxybenzoic acid derivative of the general formula (V),

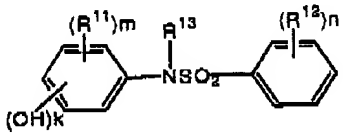


(V)

wherein Z is an oxygen atom or –NH group, R^{23} is an alkyl group, an alkenyl group, aralkyl group or an aryl group, and d represents an integer of 1 to 4.

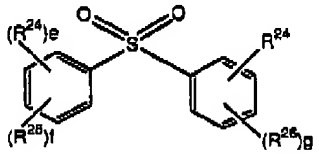
63. (New) The heat-sensitive recording material of claim 60, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

64. (New) The heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein the heat-sensitive recording layer contains at least one member selected from benzenesulfonamide derivatives of the general formula (II),



(II)

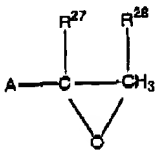
wherein each of R^{11}, R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2, and also contains at least one member selected from diphenylsulfone derivatives of the general formula (VI),



(VI)

wherein R^{24} is a group

HIZATATE et al.
Serial No. 09/890,818



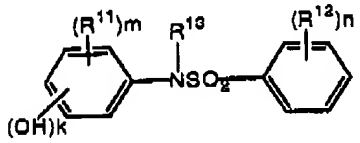
in which A represents $-(CH_2)_h-$, $-O(CH_2)_i-$ or $-O(CH_2)_jO(CH_2)_v-$, each of R^{27} and R^{28} respectively represents a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, each of h and i represents an integer of 0 to 5, and each of j and v. represents an integer of 1 to 5, each of R^{25} and R^{26} respectively represents a halogen atom, an alkyl group having 1 to 6 carbon atoms, an alkoxyl group having 1 to 6 carbon atoms or a benzyloxy group which may have a substituent, e represents an integer of 0 or 1, f represents an integer of 0 to 5 and g represents an integer of 0 to 4.

65. (New) The heat-sensitive recording material of claim 64, wherein the benzenesulfonamide derivative(s) is/are N-(4-hydroxyphenyl)-p-toluenesulfonamide and/or N-(2-hydroxyphenyl)-p-toluenesulfonamide.

66. (New) The heat-sensitive recording material of claim 64, wherein the diphenylsulfone derivative is 4-benzyloxy-4'-(2-methylglycidyloxy)diphenylsulfone.

67. A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said heat-sensitive

recording layer contains at least one member selected from the benzenesulfonamide derivatives of the general formula (II),

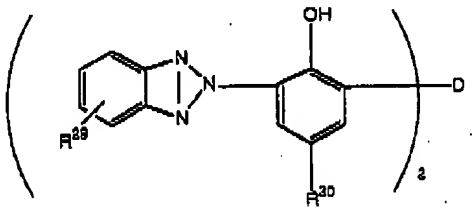


(II)

wherein each of R^{11}, R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2, and also contains an ultraviolet absorbent.

68. (New) The heat-sensitive recording material of claim 67, wherein the ultraviolet absorbent is a benzotriazole derivative.

69. (New) The heat-sensitive recording material of claim 67, wherein the ultraviolet absorbent is a dimer of a benzotriazole derivative of the general formula (VII),

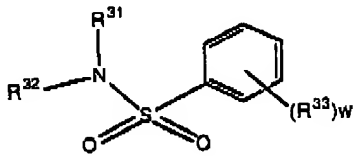


(VII)

wherein R^{29} represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxyl group, an aryl group or an aryloxy group, R^{30} is an alkyl group having 1 to 18 carbon atoms, and D is an alkylidene group having 1 to 8 carbon atoms.

70. (New) The heat-sensitive recording material of claim 67, wherein the benzenesulfonamide derivative is N-(2-hydroxyphenyl)-p-toluenesulfonamide or N-(4-hydroxyphenyl)-p-toluenesulfonamide.

71. (New) The heat-sensitive recording material of claim 67, wherein the heat-sensitive recording layer contains a compound of the general formula (VIII),

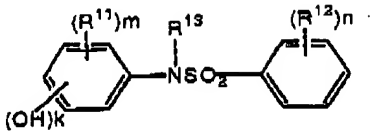


(VIII)

wherein each of R^{31} and R^{32} respectively represents a hydrogen atom, an alkyl group, an aralkyl group or an aryl group, respectively, R^{33} represents an alkyl group, an alkoxyl group, an alkenyl group, an aralkyl group or an aryl group, and w represents an integer of 0 to 5.

72. (New) The heat-sensitive recording material of claim 67, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

73. (New) A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said heat-sensitive recording layer contains at least one member selected from the benzenesulfonamide derivatives of the general formula (II),



(II)

wherein each of R^{11}, R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms,

n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2, and contains an aromatic isocyanate compound.

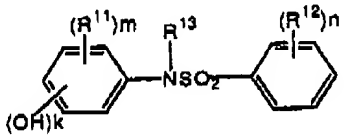
74. (New) The heat-sensitive recording material of claim 73, wherein the heat-sensitive recording layer contains an imino compound.

75. (New) The heat-sensitive recording material of claim 73, wherein the heat-sensitive recording layer contains at least two benzenesulfonamide derivatives of the general formula (II).

76. (New) The heat-sensitive recording material of claim 73, wherein N-(4-hydroxyphenyl)-p-toluenesulfonamide is contained or N-(4-hydroxyphenyl)-p-toluenesulfonamide and N-(2-hydroxyphenyl)-p-toluenesulfonamide are contained as benzenesulfonamide derivatives.

77. (New) A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor

under heat to cause said electron-donating dye precursor to form a color, wherein said substrate contains a recycled paper pulp, and a benzenesulfonamide derivative of the general formula (II),



(II)

wherein each of R^{11}, R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2, is used as the electron-accepting compound.

78. (New) The heat-sensitive recording material of claim 77, wherein at least two benzenesulfonamide derivatives are used in combination.

79. (New) The heat-sensitive recording material of claim 78, wherein the benzenesulfonamide derivative(s) is/are N-(4-hydroxyphenyl)-p-toluenesulfonamide or a combination of N-(4-hydroxyphenyl)-p-toluenesulfonamide and N-(2-hydroxyphenyl)-p-toluenesulfonamide.

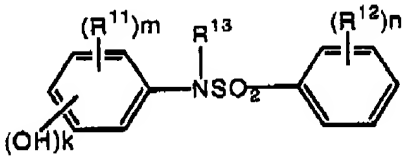
80. (New) The heat-sensitive recording material of claim 77, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

81. (New) A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and

an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said substrate contains a non-wood pulp and at least one selected from a benzenesulfonamide derivative, a diphenylsulfonamide derivative, an benzoic acid derivative or a diphenylmethane derivative is used as the electron-accepting compound.

82. (New) The heat-sensitive recording material of claim 81, wherein the substrate has a non-wood pulp content of at least 10 % by weight.

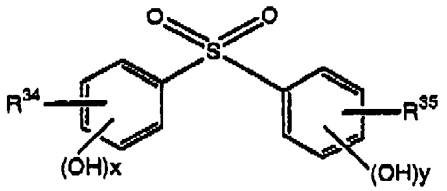
83. (New) The heat-sensitive recording material of claim 81, wherein the benzenesulfonamide derivative is a compound of the general formula (II),



(II)

wherein each of R^{11}, R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2.

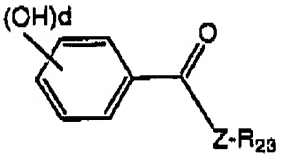
84. (New) The heat-sensitive recording material of claim 81, wherein the diphenylsulfone derivative is a compound of the general formula (IX),



(IX)

wherein each of R^{34} and R^{35} respectively represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxyl group, an alkenyl group, an aralkyl group, an aryl group, an alkenyloxy group, an aralkyloxy group or an aryloxy group, x represents an integer of 1 to 3, and y represents an integer of 0 to 2.

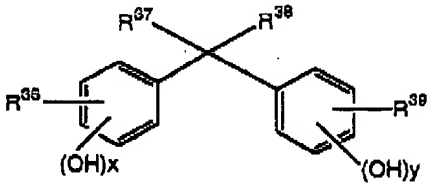
85. (New) The heat-sensitive recording material of claim 81, wherein the benzoic acid derivative is a compound of the general formula (V),



(V)

wherein Z is an oxygen atom or –NH group, R^{23} is an alkyl group, an alkenyl group, aralkyl group or an aryl group, and d represents an integer of 1 to 4.

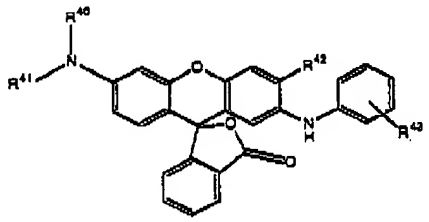
86. (New) The heat-sensitive recording material of claim 81, wherein the diphenylmethane derivative is a compound of the general formula (X),



(X)

wherein each R^{36} to R^{39} respectively represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxyl group, an alkenyl group, an aralkyl group, an aryl group, an alkenyloxy group, an aralkyloxy group, an aryloxy group or an alkoxycrbonylalkyl group, R^{37} and R^{38} may bond to each other to form a ring, x represents an integer of 1 to 3, and y represents an integer of 0 to 2.

87. (New) The heat-sensitive recording material of claim 81, wherein the dye precursor is a xanthene compound of the general formula (XI),



(XI)

wherein each of R^{40} and R^{41} respectively represents an alkyl group, an aryl group or aralkyl group and may bond to each other to form a ring, R^{42} represents a hydrogen atom, a halogen atom or an alkyl group, and R^{43} represents a hydrogen atom, a halogen atom, an alkyl group or a halogenated alkyl group.